Claims

What is claimed is:

1. An optical fiber, comprising:

a refractive index profile having

a first moat with a negative delta ($\Delta 2$),

a second moat with a negative delta ($\Delta 4$), and

the refractive index profile is selected to provide

a negative total dispersion at 1550 nm,

a kappa value, defined as total dispersion divided by dispersion slope at 1550 nm, of less than 75 nm.

2. The fiber of claim 1 further comprising

a central core having a positive delta ($\Delta 1$), and

a ring surrounding the first moat having a positive delta ($\Delta 3$).

3. The fiber of claim 1 wherein the total dispersion at 1550 nm is more negative than about –40 ps/nm/km.

4. The fiber of claim 1 wherein the total dispersion at 1550 nm is more negative than –40 and less negative than –400 ps/nm/km.

5. The fiber of claim 1 wherein the total dispersion at 1550 nm is more negative than about –140 ps/nm/km.

6. The fiber of claim 1 wherein the dispersion slope at 1550 nm is less than –0.75 and greater than –8.50 ps/nm^2/km.

7. The fiber of claim 1 wherein kappa at 1550 nm is between about 40 and 75 nm.

8. The fiber of claim 1 including a pin array bend loss at 1550 nm of less than 9 dB.

9. The fiber of claim 1 wherein a central core has a delta ($\Delta 1$) of less than 2.0 %.

10. The fiber of claim 9 wherein an outer core radius (R1) of the central core is between about 1.2 and 3.1 microns.

11. The fiber of claim 9 wherein the central core has an alpha (α) of less than about 6.

12. The fiber of claim 1 wherein delta ($\Delta 2$) of the first moat is less than -0.2%.

13. The fiber of claim 12 wherein an outer radius (R2) of the first moat is located between about 4.5 and 10.6 microns.

14. The fiber of claim 1 wherein delta ($\Delta 4$) of the second moat is less than -0.05 %.

15. The fiber of claim 14 wherein an outer radius (R5) of the second moat is between about 19.5 and 37.5 microns.

16. An optical transmission line, wherein the fiber as set forth in claim 1 is a dispersion compensating fiber optically coupled to a transmission fiber, the transmission fiber having:

a total dispersion between 2 and 6 ps/nm/km at 1550 nm, and

a positive dispersion slope of less than 0.092 ps/nm^2/km at 1550 nm.

17. The line of claim 16 wherein the transmission fiber comprises a kappa value, defined as total dispersion at 1550 nm divided by dispersion slope at 1550 nm, of between 40 and 75 nm.

18. The line of claim 16 wherein a High-to-Low residual dispersion for the transmission line over an entire C band having a wavelength range from 1525 nm to 1565 nm is less than 50 ps/nm for a 100 km length of transmission fiber.

19. The line of claim 16 wherein the dispersion compensating fiber is optically coupled to a trim fiber which has:

a total dispersion between 14 and 21 ps/nm/km at 1550 nm, and

a positive dispersion slope of between 0.04 and 0.07 ps/nm^2/km at 1550 nm.

20. A dispersion compensation fiber, comprising:

a refractive index profile including

a central core having a positive core delta (Δ1) less than 2.0% and an outer radius (R1) between 1.2 and 3.1 microns,

a first moat having a moat delta (Δ2) more negative than -0.2 % and an outer radius (R2) of between 4.5 and 10.6 microns,

a ring having a positive ring delta (Δ3) greater than 0.2 % and a center radius (R3) of between 6.5 and 12.0 microns, and

a second moat having a delta (Δ4) less than –0.05% and an outer radius (R5) between 19.5 and 37.5 microns;

the refractive index profile selected to provide

a total dispersion less than –40 and greater than -400 ps/nm/km at 1550 nm;

a dispersion slope of between -0.75 and –8.5 ps/nm^2/km at 1550 nm; and

kappa, defined as total dispersion at 1550 nm divided by dispersion slope at 1550 nm, of greater than 40 and less than 75 nm.